# GCT Series – 4 to 20mA loop Gage Heads



- **4-20mA loop, two wire operation**
- **Hermetically sealed housing**
- **25 µ-inch [0.6 µm] repeatability**
- **IEC IP68 rating to 1,000 PSI [70 bars]**
- **Stroke ranges from 0.250 up to 2 inches**
- **Reverse polarity protection**
- **Hardened tool steel contact tip**
- **High side load resistance**

## DESCRIPTION

**The GCT Series** heavy-duty gage heads enable high performance in environments containing moisture, dirt, and fluid contaminants. With a spring loaded LVDT, a precision linear bearing, and internal signal conditioning electronics operating on a 4 to 20mA loop, the GCT is ideal for difficult industrial environments and remote locations where sensor power is not readily available and long cable runs are expected. The 4-20mA signal is less susceptible to EMI and RFI interference than low amplitude AC or DC signals.

These robust gage heads allow measurements over stroke ranges from 0 to 0.250 inch [6.35mm] up to 0 to 2 inches [50.8mm]. The spring force is typically 9oz [255 grams] at fully compressed electrical stroke. A removable black-chromed, hardened tool steel tip is threaded (4-48UNF-2A) to the working end. Internal construction prevents the core and shaft from rotating as they move longitudinally. The integral electrical connector (welded) provides for easy installation and allows replacing a damaged cable without sacrificing the sensor. Installation and adjustment are facilitated by an external ½-20 mounting thread and the two locknuts supplied with each unit.

Like in most of our LVDTs, the GCT windings are vacuum impregnated with a specially formulated, high temperature, flexible resin, and the coil assembly is potted inside its housing with a two-component epoxy. This provides excellent protection against hostile environments such as high vibration and shock.

The ruggedness, long life cycle, and very high reliability of the GCT Series provide the lowest cost of ownership over the life of the equipment onto which they are installed. The one-piece front end (barrel which contains the bearing assembly), machined from solid stainless steel bar, coupled with a bronze bushing, has far greater resistance to bending forces and side loads compared to other designs. This is particularly important on the longer stroke versions; it reduces the common risk of probe damage/bending during installation or maintenance of industrial equipment. The GCT Series designs also require fewer parts and weld joints, thereby increasing overall structural integrity and reliability.

MEAS offers options, such as mating connector plugs, special contact tips (including AGD dial indicator tips), air-extend/spring retract, and cable assemblies. Also see our other models with built-in signal conditioning, **GCD** (bipolar DC voltage), **GCD-SE** (single-ended DC voltage) and **GC-485** (RS-485 Digital Series), as well as the AC operated **GCA**.

*MEAS acquired Schaevitz Sensors and the **Schaevitz™** trademark in 2000.*

## FEATURES

- All-welded stainless steel construction
- Resistant to harsh environments
- MS type connector (MIL-C-5015)
- Long cycle life
- Reverse polarity protection
- Calibration certificate supplied with each unit
- Air extend/spring retract available *(Consult factory)*

## APPLICATIONS

- Bridge expansion monitoring
- Pipeline vibration monitoring
- Valve position
- Compressor feedback
- Noisy environments / long cable runs
- In-process measurements (feedback loop with PLC or CNC controller)

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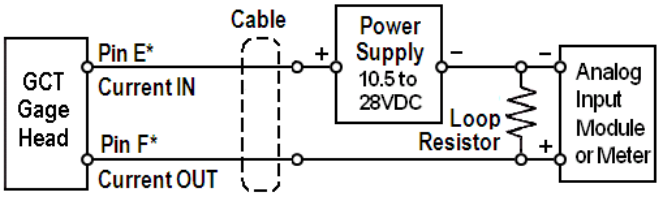
## PERFORMANCE SPECIFICATIONS

| ELECTRICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| **Parameter** | **GCT 250** | **GCT 500** | **GCT 1000** | **GCT 2000** |
| Stroke/gaging range | 0.25 [6.4] | 0.50 [12.7] | 1 [25.4] | 2 [50.8] |
| Sensitivity, mA per inch | 64 | 32 | 16 | 8 |
| Loop supply voltage | 10.5 to 28VDC | | | |
| Output | 4 to 20mA, two wire loop (Output increases when core is displaced towards connector) | | | |
| Output at null position | 12mA (null position is defined as the mid-stroke position) | | | |
| Maximum loop resistance | 540 ohms @ 24VDC (see loop resistance chart below) | | | |
| Non-linearity | ±0.5% of FR, maximum | | | |
| Output noise and ripple | 25 µA RMS maximum | | | |
| Repeatability | 25 µ-inch [0.6 µm] | | | |
| Stability | 0.1% of FSO after 30 minute warm up | | | |
| Temperature coefficient of sensitivity | 0.022%/°F [0.04%/°C] | | | |
| Frequency response (dynamic) | 15 Hz, maximum | | | |

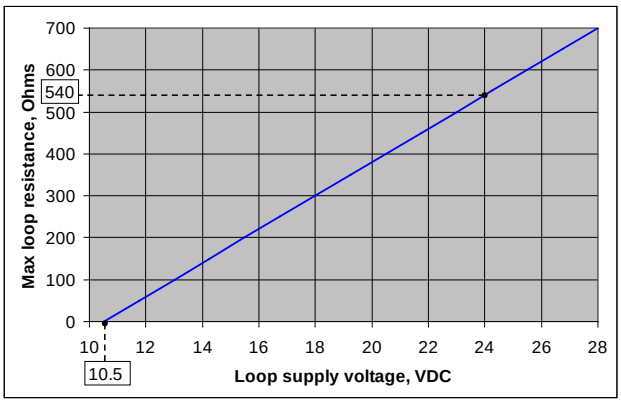
| ENVIRONMENTAL SPECIFICATIONS & MATERIALS | |
|---|---|
| Operating temperature | -13°F to +185°F [-25°C to 85°C] |
| Survival temperature | -65°F to +250°F [-55°C to 125°C] |
| Shock survival | 250 g (11ms half-sine) |
| Vibration tolerance | 10 g up to 2kHz |
| Housing material | AISI 400 Series stainless steel |
| Electrical connector | 6-pin MS type connector (MIL-C-5015) |
| IEC 60529 rating | IP68 to 1,000 PSI [70 bars] with use of proper mating connector plug |

*Notes:*
*All values are nominal unless otherwise noted*
*Dimensions are in inch [mm] unless otherwise noted*
*FR: Full Range is the stroke range, end to end; FR=S for a 0 to S stroke range*
*FSO (Full Scale Output): Largest absolute value of the outputs measured at the ends of the range*

## WIRING SCHEMATIC & LOOP RESISTANCE



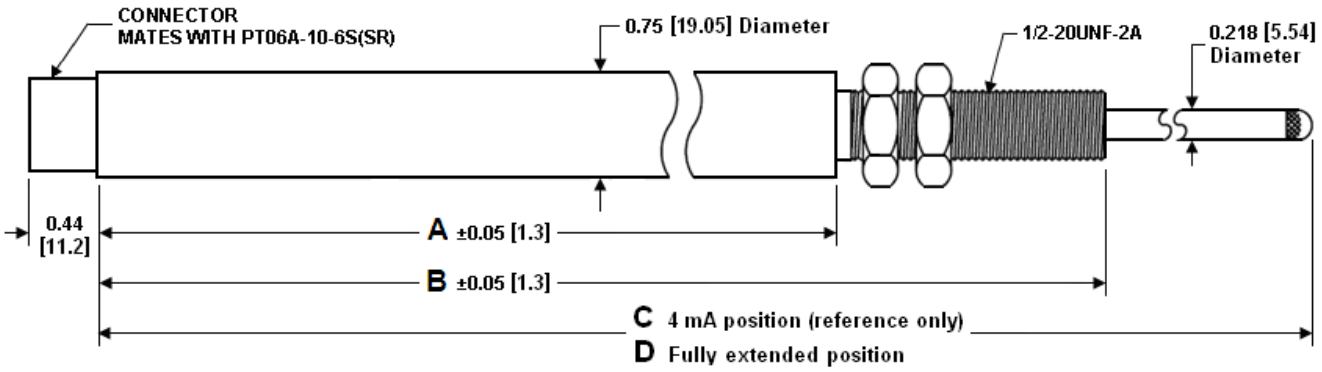

** Pins A through D: No connection*



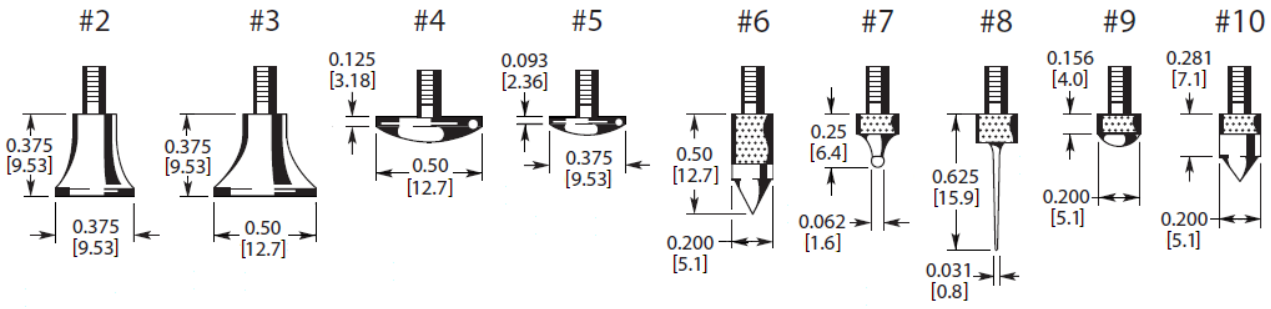
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## MECHANICAL SPECIFICATIONS

| Parameter | GCT 250 | GCT 500 | GCT 1000 | GCT 2000 |
|---|---|---|---|---|
| Stroke/gaging range | 0.25 [6.4] | 0.50 [12.7] | 1 [25.4] | 2 [50.8] |
| Pre-travel | 0.20 [5.1] | 0.20 [5.1] | 0.15 [3.8] | 0.20 [5.1] |
| Over-travel | 0.25 [6.3] | 0.05 [1.3] | 0.20 [5.1] | 0.05 [1.3] |
| Main body length “A” | 4.66 [118.4] | 5.79 [147.1] | 7.20 [182.9] | 9.45 [240.0] |
| Overall body length “B” | 6.03 [153.2] | 7.15 [181.6] | 10.17 [258.3] | 12.43 [315.7] |
| Plunger length “C”<br>(4mA position, reference only) | 6.72 [170.7] | 7.68 [195.1] | 11.97 [304.0] | 13.66 [347.0] |
| Plunger length “D”<br>(fully extended/”4mA” side) | 7.06 [179.3] | 8.18 [207.8] | 12.65 [321.3] | 14.9 [378.5] |
| Spring force | Typically 9oz [255 grams] at fully compressed electrical stroke | | | |




## REPLACEMENT/OPTIONAL CONTACT TIPS




*Dimensions are in inch [mm]*

# GCT Series – 4 to 20mA loop Gage Heads

## ORDERING INFORMATION

| Description | Model | Part Number |
|---|---|---|
| 0 to 0.25 inch gage head | GCT 250 | 72350000-000 |
| 0 to 0.5 inch gage head | GCT 500 | 72350001-000 |
| 0 to 1 inch gage head | GCT 1000 | 72350002-000 |
| 0 to 2 inch gage head | GCT 2000 | 72350003-000 |
| **OPTIONS** | | |
| Air extend/spring retract gage head *(Consult factory)* | All GC Series | xxxxxxxx-150 |
| **ACCESSORIES** | | |
| DC power supply (15VDC) | PSD 40-15 | 02291339-000 |
| Mating connector kit | PT06A-10-6S(SR) | 62101011-000 |
| Replacement contact tips | Contact Tip 2 | 67010005-000 |
| | Contact Tip 3 | 67010006-000 |
| | Contact Tip 4 | 67010002-000 |
| | Contact Tip 5 | 67010007-000 |
| | Contact Tip 6 | 67010008-000 |
| | Contact Tip 7 | 67010009-000 |
| | Contact Tip 8 | 67010010-000 |
| | Contact Tip 9 | 67010001-000 |
| | Contact Tip 10 | 67010011-000 |

*Refer to our "Options and Accessories for Gage Head" data sheet.*

## TECHNICAL CONTACT INFORMATION

### ABOUT MACRO SENSORS

Macro Sensors, founded by Howard A. Schaevitz, has more than three hundred man-years of experience in just one thing: the design and manufacture of LVDTs. We believe that you need solutions, not simply products. When you call us, you get the benefit of our experience and our commitment.

Most products listed are in stock for immediate delivery, and we strive to offer the finest customer service in the industry: technical support from people who understand LVDTs and how to apply them to your benefit, and a commitment to excellent pricing, quality products, and deliveries that you can truly rely on. Macro Sensors also has a comprehensive network of representatives and distributors in the U.S. and around the world to provide you with local support.

We manufacture an enormous array of LVDTs, from modified standards to complete custom designs. Our customers consistently tell us it is Macro Sensors? quality and service that keeps them coming back. Let our experience go to work for you.

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